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Compact guides

LUCAS

**The EU's land use
and land cover survey**

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Eurostat's Land Use/Cover Area frame Survey — LUCAS — provides harmonised statistics on land use and land cover across the European Union.

LUCAS provides information for monitoring a range of socio-environmental challenges, such as land take, soil degradation, the environmental impact of agriculture or the degree of landscape fragmentation.

Land cover is:

⇨ the bio-physical coverage of land (for example, crops, forest, buildings and roads or lakes).

Land use is:

⇨ the socioeconomic use made of land (for example, agriculture, commerce, residential use or recreation).

Examples of different types of land cover

Examples of different types of land use

Land cover in LUCAS is specified according to a classification with 76 subclasses. At its most basic level: artificial land; cropland; woodland; shrubland; grassland; bare land and lichens/moss; water areas; wetlands.

Land use is specified according to 33 distinct classes that cover the primary sector (for example, agriculture and forestry); the secondary sector (industry); the tertiary sector (services); and other uses (for example, residential use and abandoned areas).

The LUCAS survey:

⇨ is a harmonised in-situ land cover and land use data collection exercise extending across the whole of the EU;

⇨ is based on a standard survey methodology (two phase sampling, classifications, data collection processes);

⇨ is a flexible multipurpose platform allowing the collection of specific ad-hoc modules according to policy needs;

⇨ reduces the statistical burden on farmers and other land owners — they do not need to reply to questionnaires.

At each survey point, the surveyor:

⇨ observes the land cover;

⇨ observes the land use;

⇨ notes other environmental parameters on the ground (for example, irrigation, grazing, burned areas, fire breaks);

⇨ takes a series of photographs (of the reference point, as well as pictures to the north, south, east and west);

⇨ walks 250 metres in an eastwards direction (a 'transect'), recording the different land cover and linear elements, such as walls, hedges, roads, railway lines, irrigation channels or electric power lines;

⇨ takes a top soil sample, if foreseen as a specific ad-hoc module (in the 2009 survey a sample was taken for 10 % of the points).
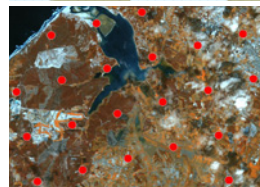

A geo-referenced point next to a field (central photograph) and pictures to the north, south, east and west

Sampling strategy: sampling design

First phase sample for stratification: orthophoto interpretation
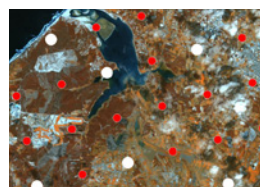

2 km square grid

1 100 000 points

Land cover strata

1 Arable land	5 Bare land, rare vegetation
2 Permanent crops	6 Artificial land
3 Grassland	7 Water
4 Wooded land and shrubland	

Second phase sample: in-situ data collection

Sample of around 270 000 points (LUCAS 2012)

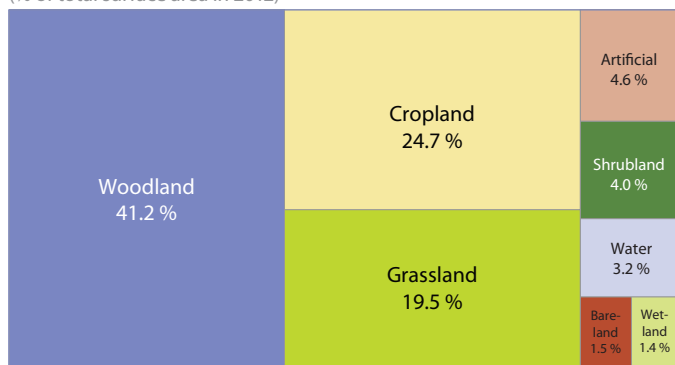

Ground survey

Parameters
- Land cover
- Pictures
- Land use
- etc.

LUCAS — schema for data collection exercise

LUCAS 2012:
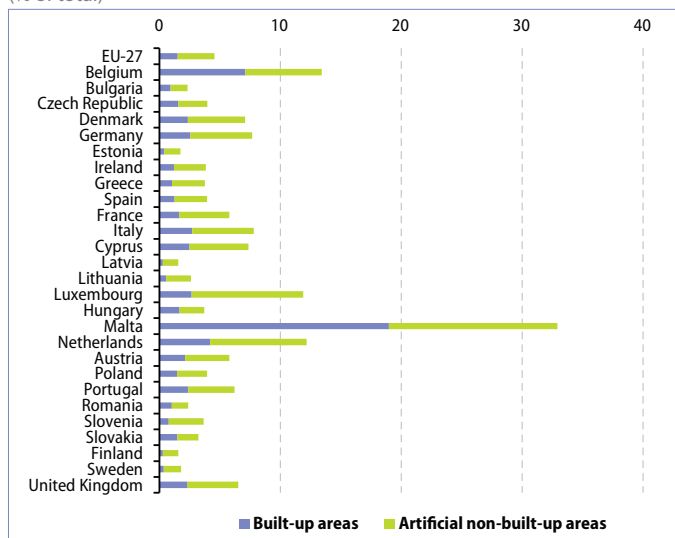
⇨ was based on 270 000 points/observations;

⇨ each point was selected from a master sample of 1.1 million nodes corresponding to a 2*2 km grid overlaying the whole of the EU);

⇨ the points were visited by 750 field surveyors;

⇨ the survey took place between March and September 2012.

Land cover in the EU-27
(% of total surface area in 2012)

Woodland 41.2 %	Cropland 24.7 %	Artificial 4.6 %
		Shrubland 4.0 %
	Grassland 19.5 %	Water 3.2 %
		Bare-land 1.5 % / Wet-land 1.4 %

Source: Eurostat (online data code: lan_lcv_ovw)

Share of artifical land in total land cover, 2012
(% of total)

EU-27
Belgium
Bulgaria
Czech Republic
Denmark
Germany
Estonia
Ireland
Greece
Spain
France
Italy
Cyprus
Latvia
Lithuania
Luxembourg
Hungary
Malta
Netherlands
Austria
Poland
Portugal
Romania
Slovenia
Slovakia
Finland
Sweden
United Kingdom

■ Built-up areas ■ Artificial non-built-up areas

Source: Eurostat (online data code: lan_lcv_art)

Policy areas:

Data from LUCAS can be used to help analyse and contribute to the development of various EU policy areas:

⇨ Common Agricultural Policy
Integrating environmental concerns into the Common Agricultural Policy;

⇨ Soil thematic strategy
Protecting the soil, as detailed in the soil thematic strategy;

⇨ EU biodiversity strategy
Promoting biodiversity and conservation, through the EU's biodiversity strategy;

⇨ Europe 2020
Encouraging the efficient use of resources for sustainable growth, as in the resource-efficient Europe initiative;

⇨ Copernicus
Land monitoring, spatial planning and resource management, as carried out by the Copernicus earth observation programme;

⇨ Climate change
Tackling climate change, through monitoring conducted by the European Environment Agency, as well as actions under the European climate change programme.

Sunflowers in a field

What is LUCAS used for?

Land, a limited resource

The limited availability of land for competing uses is of increasing concern. The augmented demand for more living space per person, higher levels of economic activity, increased mobility and the growth of transport infrastructure have resulted in the conversion of agricultural and natural areas into urban areas, roads and other infrastructure projects.

Man-made surfaces are an important source of water, soil and air pollution, and the sealing of land by these surfaces can impact upon the water balance, thereby increasing the risk and intensity of flooding. This process of 'land take' also reduces the area available for natural habitats and ecosystems, with the fragmentation of wildlife habitats being a major concern.

Land use trends have been monitored over time using Corine Land Cover data, which is validated using information from LUCAS. The results suggest that artificial land cover increased by an average of 0.5 % per annum across 38 European countries during the period 1996–2006, with 'land take' being much more pronounced in some regions.

Land cover and land use data from LUCAS are also used to monitor the increase of urban areas and the productivity of artificial areas (in relation to GDP). Both of these indicators are included within the resource efficiency scoreboard that has been designed to assess the progress being made towards a resource-efficient, low-carbon economy — one of the key objectives of the Europe 2020 strategy.

An example of land take between the 2009 and 2012 surveys

Landscape and ecosystem services

The presence of grass verges, hedges, dry stone walls, ditches and other semi-natural linear elements is considered to be of fundamental importance to help promote biodiversity and habitats, providing ecosystem services such as pollination or pest control. The LUCAS 'transect' provides information on the presence and evolution of linear elements and allows for an assessment of these elements at a regional level.
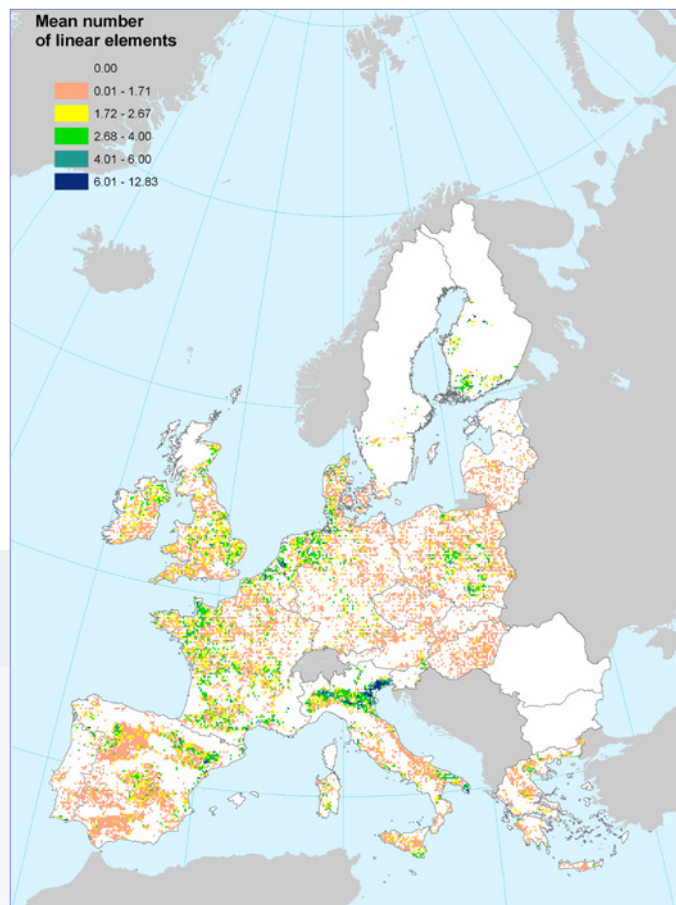
Spatial distribution of linear elements, average number calculated by 10x10 km cells (LUCAS 2009)

Source: http://agrienv.jrc.ec.europa.eu/publications/pdfs/ EUR_25114.pdf

Soil, an essential element for agriculture

Soil is a key agricultural resource and therefore of prime interest to policymakers concerned with the Common Agricultural Policy. Soil quality and soil erosion are assessed through two agro-environmental indicators. The 2009 LUCAS exercise collected soil samples which allowed soil quality (organic carbon content) and other parameters such as soil texture, structure and permeability to be measured. These parameters contributed to the evaluation of soil erosion, for example:

⇨ approximately 15 % of the EU's territory is estimated to be affected by moderate or high levels of soil erosion each year;

⇨ the main causes of soil erosion in Europe are inappropriate agricultural practices, deforestation, over-grazing and construction activities;

⇨ the erosion rate depends on climate, land use, topography and soil, as well as on agricultural practices;

⇨ soil erosion by water is a widespread problem in Europe and affects 12 % of the EU's territory.

Soil erosion

More information and further examples of how LUCAS is used can be found at: http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/publications/use_cases

Additional information on LUCAS:

LUCAS website

http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/introduction

The LUCAS dedicated section

Methodology

http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/methodology

Publications on the LUCAS website

http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/publications

LUCAS – Land use and land cover survey

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=LUCAS_-_Land_use_and_land_cover_survey

Land cover and land use statistics at regional level

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Land_cover_and_land_use_statistics_at_regional_level

Access to LUCAS data:

Statistical tables

http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/database

LUCAS micro data

Elementary data can be downloaded by country

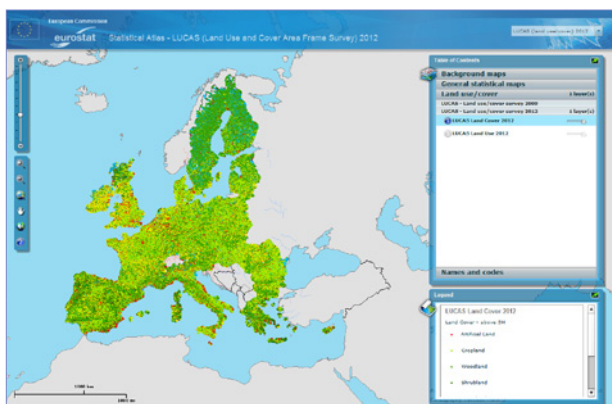http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/LUCAS_primary_data

LUCAS photos

Photos can be requested through an online form

http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/LUCAS_primary_data/form

LUCAS online viewer

http://ec.europa.eu/eurostat/statistical-atlas/gis/viewer/?myConfig=LUCAS-2012.xml

LUCAS online viewer

LUCAS soil data

Soil data can also be accessed online

http://eusoils.jrc.ec.europa.eu/projects/Lucas/Data.html